

New Data on the Fruit Flies (Diptera: Tephritidae) in the Fauna of Iran

S. Mohamadzade Namin

Department of Plant Protection
Faculty of Agriculture
Islamic Azad University, Varamin-Pishva Branch, Varamin, Iran.

E-mail: mohamadzade@iauvaramin.ac.ir

Mohamadzade Namin, S. New data on the fruit flies (Diptera: Tephritidae) in the fauna of Iran. Summary. As a result of studies on fruit flies in Iran during 2008–2011, nine species, *Campiglossa difficilis* (Hendel), *Tephritis admissa* Hering, *Tep. divisa* Rondani, *Tep. hendeliana* Hering, *Terellia fuscicornis* (Loew), *Ter. tussilaginis* (Fabricius), *Urophora anthropovi* Korneyev & White, *U. longicauda* (Hendel) and *U. pontica* (Hering), are recorded for the first time from Iran. *Carduus thoermeri armenus* is reported as a new host plant of *Tephritis hendeliana*.

Key words: Diptera, Tephritidae, fruit flies, Iran, new records.

Мохамадзаде-Намин С. Новые данные о мухах-пестрокрылках (Diptera: Tephritidae) в фауне Ирана. Резюме. В результате изучения пестрокрылок в Иране в течение 2008–2011 гг., девять видов: *Campiglossa difficilis* (Hendel), *Tephritis admissa* Hering, *Tep. divisa* Rondani, *Tep. hendeliana* Hering, *Terellia fuscicornis* (Loew), *Ter. tussilaginis* (Fabricius), *Urophora anthropovi* Korneyev & White, *U. longicauda* (Hendel) и *U. pontica* (Hering), — отмечены впервые из Ирана. *Carduus thoermeri armenus* впервые указан как кормовое растение *Tephritis hendeliana*.

Ключевые слова: Diptera, Tephritidae, мухи-пестрокрылки, Иран, новые находки.

Мохамадзаде-Намін С. Нові відомості про мух-осетниць (Diptera: Tephritidae) у фауні Ірану. Резюме. В результаті вивчення осетниць в Ірані протягом 2008–2011 рр., дев'ять видів: *Campiglossa difficilis* (Hendel), *Tephritis admissa* Hering, *Tep. divisa* Rondani, *Tep. hendeliana* Hering, *Terellia fuscicornis* (Loew), *Ter. tussilaginis* (Fabricius), *Urophora anthropovi* Korneyev & White, *U. longicauda* (Hendel) і *U. pontica* (Hering), — відмічено вперше з Ірану. *Carduus thoermeri armenus* вперше наведено як кормову рослину *Tephritis hendeliana*.

Key words: Diptera, Tephritidae, мухи-осетниці, Іран, нові знахідки.

Introduction

The family Tephritidae is one of the most economically important families of acalyptate Diptera. Larvae develop in fruits, leaf-mines or within flower heads of Asteraceae plants. Some species are serious pests in agriculture and some other species useful for the control of weeds (White, 1988).

The Iranian fruit fly fauna was studied in the last decade and over 50 species were reported by various authors in these years (see Mohamadzade Namin, Mozari & Rasoulzadeh, 2010; Mohamadzade Namin & Nozari, 2011 for references), but still has not been properly studied.

Material and methods

Material was collected by a standard sweeping net or reared from flower heads of asteraceous plants. All the specimens are deposited in author's personal collection.

Species were identified by means of the keys by Hendel (1927), Freidberg & Kugler (1989), Merz (1994) and Korneyev & White (1992; 1999).

Results

During studies on fruit fly fauna in 2008–2011, nine species of subfamily Tephritinae were collected for the first time for Iranian fauna. *Carduus thoermeri armenus* was found to be a new host plant for *Tephritis hendeliana*. In most cases, the host plants of the other species have been identified only to genus level only.

The tribes, genera and species are listed in alphabetic order. Detailed morphological descriptions are not given. For further information, refer to the works by Hendel (1927), White (1988), Freidberg & Kugler (1989), Merz (1994) and Korneyev & White (1999).

Subfamily Tephritinae

Tribe Myopitini

Urophora anthropovi Korneyev & White, 1992 (Fig. 1)

Korneyev & White, 1992; 1999.

Material examined: Khorasan Razavi province, Chaldran, Firizi Valley, N: 36°28.433, E: 58°56.774, 2000m, 12.VII.2011, 3 ♂, 3 ♀ (Mohammadzade Namin leg.).

Host plant: Unknown.

Distribution: Turkmenistan (Norrbom *et al.*, 1999), Iran (first record).

Diagnosis: Wing hyaline, subbasal crossband completely reduced, discal crossband present as a darkening in distal part of stigma and r-m crossvein. Preapical crossband usually reduced and apical crossband started from middle part of cell r_1 to apex of M_{1+2} (Fig. 1). Antennae, femora and notopleura black. Aculeus pointed without preapical steps (see Korneyev & White, 1992, Fig. 8).

Urophora longicauda (Hendel, 1927) (Fig. 2)

Korneyev & White, 1999.

Material examined: Mazandaran province, Haraz road, Rineh, South mountainside of Damavand, N: 35°52.168, E: 52°06.329 E, 2500 m, swept from flower heads of *Cousinia* sp., 2.VII.2010, 1 ♂, 4 ♀ (Mohammadzade Namin leg.).

Host plant: *Cousinia eryngioides* (Korneyev & White, 2000).

Distribution: Russia (Astrakhan), Armenia, Kazakhstan, Uzbekistan, Kirghizia, Turkmenistan, Afghanistan

and western China (Norrbom *et al.*, 1999; Korneyev & White, 1999), Iran (first record).

Diagnosis: Antennae black. Wing pattern with 4 well developed dark brown crossbands; cell bc hyaline, subbasal and discal crossbands connected in anterior margin of the wing. Discal and preapical crossbands about as wide as r-m crossvein (Fig. 2). mesonotal scutum densely covered with gray microtrichia. All femora completely black. Aculeus pointed without preapical steps (see Korneyev & White, 1992: Fig. 12 (as *U. sciadocousiniae*)).

Urophora pontica (Hering, 1937) (Fig. 3)

Korneyev & White, 1999; 2000.

Material examined: Alburz province, Taleghan, Khoznan, swept on *Echinops* sp., N: 36°07.222, E: 50°32.737, 1650m, 12.VI.2010, 11 ♂, 14 ♀; Alburz province, Taleghan, Zidasht, swept on *Echinops* sp., N: 36°9.941, E: 50°42.785, 1900m, 12.VI.2010, 17 ♂, 22 ♀ (Mohammadzade Namin leg.).

Host plant: *Echinops ritro* and *E. tjanschanicus* (Korneyev & White, 2000).

Distribution: Spain, France, Turkey, Russia, Kazakhstan and Kirghizia (Norrbom *et al.*, 1999; Korneyev & White, 1999), Iran (first record).

Diagnosis: Antennae black. Wing pattern with 4 well developed dark brown crossbands; cell bc black, subbasal and discal crossbands connected in anterior margin of the wing. Width of r-m crossvein clearly more than width of discal and preapical crossbands (Fig. 3). Mesonotal scutum shining black. All femora completely black. Aculeus pointed without preapical steps (see Korneyev & White, 1992: Figs. 2–3).



Figs. 1–3. Myopitini species. 1. *Urophora anthropovi*. 2. *U. longicauda*. 3. *U. pontica*.

Tribe Terellini

Terellia fuscicornis (Loew, 1844) (Fig. 4)

Korneyev, 1986; Freidberg & Kugler, 1989.

Material examined: East Azerbaijan province, 30 km SE Tabriz, Sahand ski resort, swept from *Cirsium* sp., 37°45.850' N 46°30.754' E, 2900m, 30.VIII.2010, 2 ♀; West Azerbaijan province, 3 km west Ziveh, 37°07.442' N 44°48.824' E, 3000m, 31.VIII.2010, 1 ♂, 1 ♀ (Mohammadzade Namin leg.).

Host plant: *Cynara scolymus*, *C. syriaca* (Freidberg & Kugler, 1989) and *Silybum marianum* (Knio *et al.*, 2002).

Distribution: Europe, North Africa, Israel, USA (Norrbom *et al.*, 1999), Iran (first record).

Diagnosis: *T. fuscicornis* is similar with *T. nigripalpis* Hendel, sharing longitudinal stripes on thoracic pleura and whitish hairs and setulae on abdomen; differing mainly in color of antennae and palps. First flagellomere in both species is black whereas the color of scape and pedicel in *T. fuscicornis* is yellow (black in *T. nigripalpis*) (Fig. 4).

Furthermore in *T. fuscicornis* oviscapae is extremely long, as long as abdomen but *T. nigripalpis* has a short oviscapae, as long as 3 preceding abdominal tergites and it develop in *Cirsium* sp. (Mohamadzade Namin & Gharali, unpublished data).

Terellia tussilaginis (Fabricius, 1775) (Fig. 5)

Merz, 1994; Korneyev, 2003.

Material examined: Alburz province, Taleghan, Mehran valley, swept on *Arctium lappa*, N: 36°12.645, E: 50°56.303, 2100m, 12.VI.2010, 4 ♂, 2 ♀ (Mohamadzade Namin leg.).

Host plant: *Arctium tomentosum*, *A. minus* and *A. lappa* (Rikhter, 1988; Merz, 1994).

Distribution: Throughout Europe, Caucasus and Russia (Norrbon *et al.*, 1999; Merz & Korneyev, 2004), Iran (first record).

Diagnosis: *Terellia tussilaginis* differ from other species of the subgenus *Cerajocera* by having banded wing pattern with 4 well developed crossbands, normal pedicel and reddish-brown katepisternal spot. This species is differ with *Terellia nigronota* Korneyev in having yellowish subcostal cell, in addition posterior portion of discal and anterior portion of preapical crossbands distinct, yellow, brown bordered (Fig. 5). Mesonotal pattern in anterior half usually reddish to brown.



Figs. 4–5. Terellini species. 4. *Terellia fuscicornis*. 5. *T. tussilaginis*.

Tribe Tephritini

Campiglossa diffcilis (Hendel, 1927) (Fig. 6)

Hendel, 1927; Merz, 1994.

Material examined: Tehran Province, Roudheh, (Collected by light trap) 22.VI.2009, 1 ♂; Mazandaran Province, Haraz road, 5 km NE Abali, N: 35°50.304, E: 51°58.980, 2350m, 30.X.2009, 2 ♂, 2 ♀; Mazandaran Province, Haraz road, Rineh, South mountainside of Damavand, N: 35°52.168, E: 52°06.329, 2500 m, 05.VI.2011, 3 ♂, 1 ♀ (Mohamadzade Namin leg.).

Host plant: *Taraxacum officinale* (Merz, 1994).

Distribution: Throughout Europe, Russia, Syria, Iraq, Afghanistan, Kirghizia and Mongolia (Norrbon *et al.*, 1999; Korneyev & Dirlbek, 2000; Merz & Korneyev, 2004), Iran (first record).

Diagnosis: Wing pattern reticulated, with 3 hyaline spots in cell br. Posterior notopleural seta black. Oviscapae, as long as 3 preceding abdominal tergites (Fig. 6).

Tephritis admissa Hering, 1961 (Fig. 7)

Hering, 1961.

Material examined: Mazandaran province, Haraz road, Rineh, South mountainside of Damavand, N: 35°52.168, E: 52°06.329, 2500 m, reared from flower heads of *Cousinia* sp., date of collection: 2.VII.2010, date of exit: 24.VII.2010, 2 ♂, 1 ♀ (Mohamadzade Namin leg.).

Distribution: Afghanistan (Norrbon *et al.*, 1999), Iran (first record).

Diagnosis: Wing pattern reticulated, brownish. Stigma completely brown. There is only one big spot at apex of R₄₊₅ and M₁₊₂ instead of 2 and the mentioned spot isolated from remaining brown pattern of wing; r₁ cell with two large hyaline spots; cell r₂₊₃ with 3 hyaline spot in middle portion and connected with hyaline spots in cell r₁ and 2 apical spots (Fig. 7). Oviscapae about as long as 3 preceding abdominal tergites.

Tephritis divisa Rondani, 1871 (Fig. 8)

Merz, 1994.

Material examined: Mazandaran Province, Haraz road, 5 km North East Abali, N: 35°50.304, E: 51°58.980, 2360m, 8.VIII.2008, 1 ♂, 1 ♀ (Mohamadzade Namin leg.).

Host plant: *Picris echioides* (Merz, 1994)

Distribution: Spain, France, Switzerland, Italy, Sardinia, Sicily, Hungary, Greece Crete, Cyprus and Israel (Norrbon *et al.*, 1999; Merz & Korneyev, 2004), Iran (first record).

Diagnosis: Basal half of wing mainly hyaline; cell r₁ without small subapical hyaline spot. Cell r₁ with 2 large



Figs 6–9. Tephritini species. 6. *Campiglossa difficilis*. 7. *Tephritis admissa*. 8. *T. divisa*. 9. *T. hendeliana*.

hyaline marginal indentation, hyaline spot in cell r_{2+3} continuous with basal indentation of cell r_1 (Fig. 8). Wing pattern in *T. divisa* is similar with *T. separata*, but cell r_1 in *T. separata* has small subapical hyaline spot (see Merz, 1994: Fig. 20, h-k).

Tephritis hendeliana Hering, 1944 (Fig. 9)

Rikhter, 1988; Merz, 1994.

Material examined: East Azerbaijan Province, Kaleibar, reared from flower heads of *Carduus thoermeri armenus* Weinm. (new host plant), date of collection: 14.VII.2010, Date of exit: 20–24.VII.2010, 12 ♂, 14 ♀ (Mohammadzade Namin leg.).

Host plant: *Carduus nutans* (Merz, 1994).

Distribution: France, Germany, Spain, Italy, Switzerland, Andorra, Austria, Greece, Hungary, Ukraine, Romania, Caucasus, Russia and Mongolia (Norrbon *et al.*, 1999; Merz & Korneyev, 2004), Iran (first record).

Diagnosis: Wing pattern reticulated, and brownish. Two brown spots at apex of R_{4+5} and M_{1+2} isolated from remaining brown pattern of wing. Oviscape as long as pre-abdomen (Fig. 9) (in *T. hyoscyami* (Linnaeus) as long as 4 preceding abdominal tergites).

Acknowledgements

I am grateful to Dr. Valery A. Korneyev (I. I. Schmalhausen Institute of Zoology, NAS of Ukraine) and one anonymous referee for reviewing this manuscript and valuable comments.

References

- Freidberg, A. & Kugler, J. (1989). Diptera: Tephritidae. *Fauna Palaestina, Insecta*, 4, 1–212 + 8 plates.
- Hendel, F. (1927). 49. Trypetidae. In: Lindner, E., ed. *Die Fliegen der palaearktischen Region*, Vol. 5, Stuttgart, 1–221 + 17 plates.
- Hering, E. M. (1961). Ergebnisse der Deutschen Afghanistan-Expedition 1956 der Landessammlungen für Naturkunde Karlsruhe, Trypetidae (Diptera) (56. Beitrag zur Kenntnis der Trypetidae). *Beiträge zur naturkundlichen Forschung Südwestdeutschland*, 19, 319–331.
- Korneyev, V. A. (1986). Fruit flies of the tribe Terelliini (Diptera: Tephritidae) in the USSR. *Entomological Review*, 65(1): 35–55.
- Korneyev, V. A. (2003). New and little-known Tephritidae (Diptera: Cyclorrhapha) from Europe. *Vestnik zoologii*, 37(3), 3–12.
- Korneyev, V. A. & Dirlbek J. (2000). The fruit flies (Diptera: Tephritidae) of Syria, Jordan and Iraq. *Studia dipterologica*, 7(2), 463–482.

- Korneyev, V. A. & White I. M. (1992). Fruitflies of the genus *Urophora* R.-D. (Diptera, Tephritidae) of East Palaearctic. II. Review of species of the subgenus *Urophora* s. str. (Communication 1). *Entomologicheskoe Obozrenie*, 71, 688–699.
- Korneyev, V. A. & White I. M. (1993). Fruitflies of the genus *Urophora* R.-D. (Diptera, Tephritidae) of East Palaearctic. II. Review of species of the subgenus *Urophora* s. str. (Communication 1). *Entomological Review*, 72(5), 35–47.
- Korneyev, V. A. & White I. M. (1999). Tephritidae of the genus *Urophora* R.-D. (Diptera, Tephritidae) of East Palaearctic: III. Key to Palaearctic species. *Entomological Review*, 79(3), 464–482.
- Korneyev, V. A. & White I. M. (2000). Tephritidae of the genus *Urophora* R. — D. (Diptera, Tephritidae) of East Palaearctic: IV. Conclusion. *Entomological Review*, 80, 497–510.
- Knio, K. M., Kalash, S. H. & White, I. M. (2002). Flowerhead-infesting fruit flies (Diptera: Tephritidae) on thistles (Asteraceae), in Lebanon. *Journal of Natural History*, 36, 617–629.
- Merz, B. (1994). *Diptera: Tephritidae*. Insecta Helvetica Fauna, HGE Press, Geneva, 10, 1–198.
- Merz, B. & Korneyev, V. A. (2004). Fauna Europaea: Tephritidae. In: Pape T., ed. Fauna Europaea: Diptera Cyclorrhapha. Fauna Europaea, version 1.1, <http://www.faunaeur.org>. Assigned 27.01.2011.
- Mohamadzade Namin, S., Nozari, J. & Rasouljan, Gh. (2010). The fruit flies (Diptera: Tephritidae) in Tehran province, with new records for Iranian fauna. *Vestnik zoologii*, 44(1), 20–31.
- Mohamadzade Namin, S. & Nozari, J. (2010). The fruit flies (Diptera: Tephritidae) in Kurdistan province, with new records for Iranian fauna. *Ukrainska Entomofaunistyka*, 2(4), 47–53.
- Norrbom, A. L., Carroll, L. E., Thompson, F. C., White, I. M. & Freidberg, A. (1999). Systematic Database of Names. In: Thompson, F. C., ed. *Fruit Fly Expert Identification System and Systematic Information Database*, Myia, 65–299.
- Rikhter, V. A. (1988). Family Tephritidae (Trypetidae) — fruit flies. In: Bei-Bienko, G. Ya., ed. *Keys to the insects of the European part of the USSR. Vol. V. Diptera, Siphonaptera. Part 2*, Leiden, New York, 212–276.
- White, I. M. (1988). *Tephritid flies (Diptera: Tephritidae)*. Handbooks for identification on British insects, CAB International, London, 1–134.